Curriculum Vitae

VIJAY KUMAR, Ph.D.

PERSONAL:

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EDUCATION:

Postdoctoral	Pharmaceutics and Chemistry
Ph.D.	Chemistry, Concordia University, Montreal, Canada, 1981.
Ph.D.	Chemistry, Lucknow University, Lucknow, India, 1976.
M.Sc.	Chemistry, Lucknow University, Lucknow, India, 1972.
B.Sc.	Chemistry, Zoology, and Botany, Kanpur University, Kanpur, India, 1970.

PROFESSIONAL APPOINTMENTS:

Assistant Professor, Pharmaceutics Division, College of Pharmacy, The University of Iowa	7/96 - Present
Clinical Assistant Professor, Pharmaceutics Division, College of Pharmacy, The University of Iowa	6/92 - 6/96
Affiliated Academic Faculty Member, Department of Pharmaceutics, College of Pharmacy, University of Minnesota and Director, Pharmaceutical and Analytical Chemistry, Biocontrol Incorporated, Minneapolis, Minnesota	1/88 - 5/92

Research Associate, Department of Chemistry, University of Minnesota	1/87 - 12/87
Research Associate, Department of Chemistry, Michigan state University (1981-82) and University of Virginia (1982-86)	9/81 - 12/86
Postdoctoral Fellow, Department of Pharmaceutics, School of Pharmacy, University of Georgia	7/80 - 8/81
Instructor, Department of Chemistry, University of Georgia	9/79 - 6/80

RESEARCH INTERESTS:

Cellulose and Modified Cellulosic Polymers as Pharmaceutical Aids
Bioabsorbable Drug Delivery Systems
Macromolecular Prodrug Chemistry
Interpolymer Complexes and Their Use in Drug Delivery
Drug-polymer Interactions
Niosomal and Polymeric liposomal Drug Delivery Systems

Ph.D. STUDENTS CO-SUPERVISED:

1. Sanjeev Kothari (coadvisor: Dr. G. S. Banker)
   Thesis Title: Characterization of Low Crystallinity Cellulose as a Direct Compression Excipient. Effects of Physicochemical Properties of Cellulose Excipients on their tabletting characteristics
   Ph.D. degree awarded: December 1998
   Present status: Research Investigator -I, Bristol Myers Squibb Co., NJ

2. Lihua Zhu (coadvisor: Dr. G. S. Banker)
   Thesis Title: Design and Examination of Oxidized Cellulose as an Amine Drug Carrier for Implantable Drug Delivery.
   Ph.D degree awarded: July 2000
   Present status: Research Scientist, Abbott Laboratories, Chicago, IL

Ph.D./M.S. STUDENTS CURRENTLY ADVISING:

1. Tianrun Yang, Ph.D. Student (coadvisor: Dr. G. S. Banker)
   Research Project: Preparation, characterization, and Pharmaceutical Uses of oxidized cellulose.

2. Marilo Reus Medina, Ph.D. Student
   Research Project: Preparation and physical and mechanical characterization, of UICEL - A new cellulose-based direct compression excipient.

3. Dong Yang, Ph.D. Student
   Research Project: Synthesis, characterization, and uses of oxidized cellulose esters.

4. Priyanka RoyChowdhury, Ph.D. Student
   Research Project: Design and development of bioabsorbable porous oxidized cellulose films for use as polymer scaffolds in tissue engineering and as medicated pads in the treatment of skin wounds.

5. Vaibhavi Modi, M.S. Student
   Research Project: Immobilization of proteins on oxidized celluloses.

POSTDOCTORAL FELLOWS AND TECHNICIANS SUPERVISED:

1. Dr. Jichao Kang, 1998-99.
   Research Projects: 1. Preparation of oxidized cellulose microspheres containing camptothecin, an antineoplastic agent
   2. Improvement of solubility and stability of 20(S)-camptothecin through complexation with cyclodextrins

2. Dr. Xian Xian Du, 1997-98.
   Research Projects: 1. Development of an azo-linked colon-specific oxidized cellulose conjugate of 5-amino salicylic acid
   2. Syntheses of water soluble forms of oxidized cellulose and their conjugates with doxorubicin and gancyclovir

3. Dr. Ganesh S. Deshpande, 1996-97
   Research Projects: 1. Preparation of modified cyclodextrins and celluloses
   2. Immobilization of proteins on 6-carboxy cellulose
   3. Aqueous oxidized cellulose dispersions and their use in bioresorbable film coatings

4. Yuwo Yang, Technician, 1993-1996.
   Research Project:
   1. Modified celluloses as carriers for drugs and chemicals to provide improved performance in cosmetic, pharmaceutical, and agricultural products
   2. Interpolymer complexes. Interaction between polyvinyl acetate phthalate and polyvinylpyrrolidone
   3. Characterization of degradation products of dyclonine hydrochloride.

TEACHING ACTIVITIES:

A. Professional Pharmacy Program
   Pharmaceutical Technology: Solutions (PHAR 046:123), University of Iowa Professional Pharmacy Curriculum, 15 Lectures, Fall 1996-Present.

   Pharmaceutical Technology: Solids (PHAR 046:124), University of Iowa Professional Pharmacy Curriculum, 15 Lectures, Spring 2000 - Present.

   Pharmaceutical Technology: Solutions Laboratory (PHAR 046:133), University of Iowa Professional Pharmacy Curriculum, Fall 1993-1998.

   Pharmaceutical Technology: Solids Laboratory (PHAR 046:134), University of Iowa Professional Pharmacy Curriculum, Spring 1994-1999.

B. Graduate Program
   Polymers in Pharmaceutics (PHAR 046:207), University of Iowa Graduate Pharmaceutics Curriculum, Fall 1995-Present (offered every other year).

C. Nominated by Pharm. D. students and Dean of the College of Pharmacy for the Collegiate Teaching Award (1998-99).

COLLEGIATE SERVICE:

Member, Professional Pharmacy Admissions and Suspensions Committee, College of Pharmacy, The University of Iowa, 1994-Present.

Member, Pharmaceutical Care Laboratory Committee, College of Pharmacy, The University of Iowa, 1998-Present.

PROFESSIONAL ACTIVITIES:

Member, American Association of Pharmaceutical Scientists, 1992 - Present.

Member, American Chemical Society, 1979-Present.

Member, Panel of Drug Evaluators, Current Drugs Ltd., London, United Kingdom, May 1997 - 1999.

Reviewer for Journal of Pharmaceutical Science, International Journal of Pharmaceutics, International Journal of Compounding, Pharmaceutical Development and Technology, and AAPS PharmSci. Tech.

PUBLICATIONS:

Papers Published/Submitted (Peer Reviewed)

1. S. H. Kothari, V. Kumar, and G. S. Banker, "Comparative Evaluation of Powder and Mechanical Properties of Low Crystallinity Celluloses and Commercial Microcrystalline Celluloses and Powdered Celluloses," Int. J. Pharm., Submitted January 2001.

2. L. Zhu, V. Kumar, and G. S. Banker, "Examination of Oxidized Cellulose as a Macromolecular Prodrug Carrier: Preparation and Characterization of an Oxidized Cellulose-Phenylpropanolamine Conjugate," Int. J. Pharm., submitted January 2001 - under minor revision.

3. V. Kumar and T. Yang, "HNO_3-H_3PO_4-$NaNO_2$ Mediated Oxidation of Cellulose - Preparation and Characterization of Bioabsorbable Oxidized Celluloses in High Yields and With Different Levels of Oxidation, Carbohydr. Polym., submitted January 2001.

4. .Kumar, S. H. Kothari, and G. S. Banker, "Compression, Compaction, and Disintegration Properties of Low Crystallinity Celluloses Produced using Different Agitation Rates During Their Regeneration from Phosphoric Acid Solutions," Pharm. Sci. Tech., submitted December (2000) - under minor revision.

5. V. Kumar, J. Kang, and T. Yang, "Preparation and Characterization of Spray-Dried Oxidized Cellulose Microparticles," Pharm. Dev. Technol., 2001 - in press.

6. V. Kumar, J. Kang, and R. J. Hohl, "Improved Dissolution and Cytotoxicity of Camptothecin Incorporated into Oxidized Cellulose Microspheres Prepared by Spray Drying," Pharm. Dev. Technol., 2001 - in press.

7. J. Kang, V. Kumar, P. RoyChowdhary, and R. J. Hohl, "Cyclodextrin Complexation: Influence on Solubility, Stability, and Cytotoxicity of Camptothecin, an antineoplastic agent," Eur. J. Pharm. Sci., submitted October 2000 – under revision.

8. V. Kumar and G. S. Deshpande, "Immobilization of Bovine Serum Albumin on 6-Carboxycellulose, Artif. Cells, Blood Substit. Immobil. Biotechnol., 2001 – in press.

9. V. Kumar, S. Kothari, and G. S. Banker, "Effect of Agitation Rate on the Generation of Low Crystallinity Cellulose from Phosphoric Acid," J. Appl. Polym. Sci., 2001 - in press.

10. V. Kumar, T. Yang, and Y. Yang, "Interpolymer Complexation. II. Entrapment of Ibuprofen by *in-situ* Complexation between Polyvinyl Acetate Phthalate (PVAP) and Polyvinylpyrrolidone (PVP) and Development of a Chewable Tablet Formulation," Pharm. Dev. Technol., 6, 71-81 (2001).

11. V. Kumar, T. Yang, and Y. Yang, "Interpolymer Complexation. I. Preparation and Characterization of a Polyvinyl Acetate Phthalate-Polyvinyl Pyrrolidone (PVAP-PVP) Adduct," Int. J. Pharm., 188, 221 (1999).

12. V. Kumar and T. Yang, "Analysis of Carboxylic Content in Oxidized Cellulose by Solid-State Carbon-13 CP/MAS NMR spectroscopy," Int. J. Pharm. 184, 219 (1999).

13. V. Kumar and S. H. Kothari, "Effect of Compressional Force on the Crystallinity of Directly Compressible Cellulose Excipients," Int. J. Pharm., 177, 173 (1999).

14. S. Wei, V. Kumar, and G. S. Banker, "Phosphoric Acid Mediated Depolymerization and Decrystallization of Cellulose: Preparation of Low Crystallinity Cellulose - A New Pharmaceutical Excipient," Int. J. Pharm., 142, 175 (1996).

15. Cheng-yi Liang, Y. Yang, Mohammad A. Khadim, G. S. Banker, and V. Kumar, "Isolation and Characterization of Two Major Hydrolysis Products of Dyclonine Hydrochloride," J. Pharm. Sci., 84, 1141 (1995).

16. Yi-Min Ku, D. I. Min, V. Kumar, and S. E. Noormohamed, "Compatibility of Tacrolimus Injection with Cimetidine Hydrochloride Injection in 0.9% Sodium Chloride Solution," Am. J. Health-Syst. Pharm., 52, 2024 (1995).

17. Yi-Min Ku, D. I. Min, V. Kumar, and S. E. Noormohamed, "Stability of Tacrolimus in Total Parenteral Nutrition Solution," J. Pharm. Tech., 12, 58 (1995).

18. S. E. Noormohamed, V. Kumar, and D. I. Min, "Efficacy of African Traditional Medicine "Compound R" on Thermal Burns in Fuzzy Rats," J. Burn Care Rehabil., 15, 519 (1994).

19. V. Kumar and G. S. Banker, "Incompatibility of Polyvinyl Acetate Phthalate with Benzocaine. Isolation and Characterization of 4-Phthalimidobenzoic Acid Ethyl Ester," Int. J. Pharm., 79, 61 (1992).

20. C. Capomacchia, V. Kumar, and R. N. Jennings, "Internal Hydrogen Bonding in Benzo(a)pyrene Diol and Diol-epoxide Metabolites," J. Chem. Soc. Perkin Trans. II, 937 (1989).

21. V. Kumar and B. A. Averill, "Facile Synthesis of N-10 Flavin Disulfides," J. Heterocyclic Chem., 25, 241 (1988).

22. V. Kumar, K. A. Woode, R. F. Bryan, and B. A. Averill, "Evidence for a Competing Condensation Reaction in the Alloxan Synthesis of Flavins: Synthesis and Crystal and Molecular Structures of 7-Chloro-8-methyl-alloxazine and 7,10-Dimethyl-8-[(2-hydroxyethyl)thio]isoalloxazine," J. Am. Chem. Soc., 108, 490 (1986).

23. F. Bryan, K. A. Woode, V. Kumar, and B. A. Averill, "Importance of a Competing Condensation Reaction in the Alloxan Synthesis of Flavins," Acta Cryst., 40A, C-90 (1984).

24. C. Capomacchia, V. Kumar, and C. Brazzel, "Ionization Constants and Fluorescence Excitation and Emission Spectra of the Isomeric Benzo(a)pyrene Phenols," Talanta, 29, 65 (1982).

25. M. A. Khadim, V. Kumar, P. H. Bird, B. C. Pant, and L. D. Colebrook, "A Carbon-13 and Proton NMR Study of Some Aryltellurium Tris(diethyldithiocarbamates)," Org. Magn. Resonance, 13, 185 (1982).

26. M. G. Newton, R. B. King, T. W. Lee, L. Norskov-Lauritzen, and V. Kumar, "Symmetrical and Unsymmetrical Bridging Carbonyl Groups in Binuclear Molybdenum Carbonyl Complexes of Alkylaminobis(difluorophosphines): X-Ray

Crystal Structures of Two of the Complexes," J. Chem. Soc., Chem. Commun., 201 (1982).

27. J. H. Kim, K. S. Raghuveer, T. W. Lee, L. Norskov-Lauritzen, V. Kumar, M. G. Newton, and R. B. King, "The Use of Alkylaminobis(difluorophosphines) as Ligands to Stabilize Novel Binuclear Complexes," ACS Symp. Ser., 171, 489 (1981).

28. K. K. Bajpai, B. Bajpai, V. Kumar, and K. Singh, "Effect of N-substituted Groups in Dithiocarbamate on Fungicidal Propensity," Indian J. Biochem. B., 17, 109 (1981).

29. P. H. Bird, V. Kumar, and B. C. Pant, "Crystal and Molecular Structures of the (4-Alkoxy-phenyl)tellurium(IV) Trihalides: (4-EtOPh)$TeCl_3$, (4-EtOPh)$TeBr_3$, and (4-MeOPh)-TeI_3, " Inorg. Chem., 19, 2487 (1980).

30. V. Kumar, P. H. Bird, and B. C. Pant, "Preparation of Symmetrical and Unsymmetrical Diorganotellurium Chlorides Using Organolead Compounds," Synth. React. Inorg. Met. -org. Chem., 9, 203 (1979).

31. T. N. Srivastava, V. Kumar, and O. P. Srivastava, "Synthesis and Antimicrobial Activity of Some New Metal(III), Organometal(III), and Organotin(IV) Dithiocarbamates," Nat. Acad. Sci. Letters, 1, 97 (1978).

32. T. N. Srivastava, V. Kumar, and R. B. Rastogi, "Some Diorganotin Dithiocarbamates," J. Inorg. Nucl. Chem., 40, 399 (1978).

33. T. N. Srivastava, V. Kumar, and A. Bhargawa, "Some Phenyllead(IV) Dithiocarbamates," J. Inorg. Nucl. Chem., 40, 347 (1978).

34. T. N. Srivastava, V. Kumar., and A. Bhargawa, "Studies on Some Monosubstituted Diorganotin(IV) Dithiocarbamates," J. Indian Chem. Soc., 24, 591 (1977).

35. T. N. Srivastava and V. Kumar, "Studies of Some New Triphenylgermanium(IV) Dithiocarbamates," Indian J. Chem., 15A, 627 (1977).

36. T. N. Srivastava, V. Kumar, and A. Mathur, "Electric Dipole Moment of Some New Triphenyltin(IV) N,N-Disubstituted Dithiocarbamates," Indian J. Chem., 15A, 1017 (1977).

37. K. K. Bajpai, K. Singh, S. R. Misra, T. N. Srivastava, and V. Kumar, "Antifungal Activities of Diorganogallium, -indium, and -thallium Diethyldithiocarbamates," Indian Phytopatho., 29, 335 (1976).

38. T. N. Srivastava and V. Kumar, "Some Triorganotin(IV) Dithiocarbamates," J. Organometal. Chem., 107, 55 (1976).

Patents (Issued/Pending)

1. V. Kumar, "Powdered/Microfibirllated Oxidized Cellulose," U.S. Serial No 60/165,305, (UIRF Ref. No. MO-27), Filed 2000 - pending

2. V. Kumar, "Palatable Drug Granules," U.S. Patent Application Serial No. 09/437,449 (UIRF Ref. No. MO-05) Filed 1999 – pending.

3. R. F. Galask, V. Kumar, and G. S. Banker, "Topical Nonsteroidal Anti-Inflammatory Drug Composition," PCT/IB98/01400, filed September 9, 1998 – Pending; EP 98939812.8-2112 – pending.

4. R. F. Galask, V. Kumar, and G. S. Banker, Topical Nonsteroidal Anti-Inflammatory Drug Composition, US Patent, 5,888,523 (March 30, 1999).

5. G. S. Banker and V. Kumar, "Oxidized Cellulose," US Patent 5,780,618 (July 19, 1998).

6. G. S. Banker and V. Kumar, "Microfibrillated Oxycellulose Dispersions," US Patent 5,580,974 (December 3, 1996).

7. G. S. Banker and V. Kumar, "Microfibrillated Oxycellulose," US Patent 5,405,953 (May 9, 1995).

8. G. S. Banker and V. Kumar, "Oxidized Cellulose," US Patent 5,414,079 (April 11, 1995).

U.S. Provisional Patent Applications

1. V. Kumar, Powdered/Microfibrillated Cellulose, (UIRF Ref. No. MO-22), Filed September 2000.

2. V. Kumar and D. Yang, Biodegradable Oxidized Cellulose Esters, (UIRF Ref. No. MO-31), Submitted December, 2000.

Book Chapters/Reviews

1. V. Kumar and G. S. Banker, Target Oriented Drug Delivery Systems, in "Modern Pharmaceutics," G. S. Banker and C. T. Rhodes (eds.), Marcel Dekker, 4th edition, under preparation.
2. V. Kumar, G. S. Banker, and G. S. Deshpande, Aqueous Polymeric Dispersions, in "Pharmaceutical Dosage Forms: Disperse Systems," Vol. 3, H. A. Liberman, M. M. Rieger, and G. S. Banker (eds.), Marcel Dekker, 1998.

3. V. Kumar and G. S. Banker, Target Oriented Drug Delivery Systems, in "Modern Pharmaceutics," G. S. Banker and C. T. Rhodes (eds.), Marcel Dekker, Ch. 16, p. 611 (1995).

4. V. Kumar and G. S. Banker, Maillard Reactions and Drug Stability, in "Maillard Reactions in Chemistry, Food, and Health," T. P. Lebuza, G. A. Reineccius, V. Monnier, J. O'Brien, and J. Baynes (eds.), The Royal Society of Chemistry, Letchworth, Herts, United Kingdom - Spec. Pub., Royal Soc. Chem., 151, 20 (1994).

5. V. Kumar and G. S. Banker, "Chemically-Modified Cellulosic Polymers, "Drug Dev. Ind. Pharm., 19, 1 (1993).

POSTER PRESENTATIONS/INVITED LECTURES

1. V. Kumar and D. Yang, Preparation, Characterization, and Uses of Oxidized Cellulose Acetates – A New Class of Pharmaceutical Excipients, to be presented in 2001 Pharmaceutical Congress of Americas (PCA) Meeting, Orlando, FL.

2. V. Kumar, M. Reus, and D. Yang, Physicochemical and tabletting Properties of UICEL – A New Direct Compression Excipient, to be presented in 2001 Pharmaceutical Congress of Americas (PCA) Meeting, Orlando, FL.

3. New Cellulose Excipients, Fuji Chemical Industries (USA) Inc., Robinsville, NJ, January 7, 2000.

4. "UICEL – A new Cellulose-based Pharmaceutical Excipient," Invited Lecture, FMC Inc., Biopolymer Division, Princeton, NJ, November 14, 2000.

5. L. Zhu, V. Kumar, and G. S. Banker, In-vitro and In-vivo Drug Release Characteristics from Oxidized Cellulose-based Drug Entrapment Product Complex, to be presented in 2000 AAPS Annual Meeting, Indianapolis, IN.

6. T. Yang, V. Kumar, and G. S. Banker, Physical and Chemical Characterization of Oxidized Cellulose with Different Level of Carboxylic Content, 1999 AAPS Annual Meeting, Abstract No.2367, New Orleans, LA, November 16, 1999, AAPS PharmSci., 1, S-185 (1999).

7. L. Zhu, V. Kumar, and G. S. Banker, Potential Application of Oxidized Cellulose Dispersions in Drug Delivery, 1999 AAPS Annual Meeting, Abstract No. 3437, New Orleans, LA, November 17, 1999, AAPS PharmSci., 1, S-483 (1999).

8. V. Kumar, J. Kang, T. Yang, and R. J. Hohl, Preparation and Evaluation of Oxidized Cellulose Microspheres Containing 20(S)-Camptothecin, an Antineoplastic Agent, 1999 AAPS Annual Meeting, Abstract No. 3445, New Orleans, LA, November 17, 1999, AAPS PharmSci., 1, S-485 (1999).

9. V. Kumar, J. Kang, T. Yang, and R. J. Hohl, Improvement in Solubility, Stability, and Cytotoxicity of 20(S)-Camptothecin through Complexation with cyclodextrins, 1999 AAPS Annual Meeting, Abstract No. 3553, New Orleans, LA, November 17, 1999, AAPS PharmSci., 1, S-513 (1999).

10. L. Zhu and V. Kumar, and G. S. Banker, "Preparation and Characterization of Oxidized Cellulose-Phenylpropanolamine Conjugate - A Model Macromolecular Prodrug, Study" 1998 AAPS Annual Meeting, Abstract No. 2184, San Francisco, CA, November 17, 1998.

11. S. H. Kothari, V. Kumar, and G. S. Banker, "Characterization of the compaction mechanism of Low Crystallinity Powder Cellulose," 1998 AAPS Annual Meeting, Abstract No. 2117, San Francisco, CA, November 17, 1998.

12. T. Yang and V. Kumar, "Development of a Chewable Tablet Formulation," 1998 AAPS Annual Meeting, Abstract No. 2702, San Francisco, CA, November 18, 1998.

13. T. Yang and V. Kumar, "Quantitative Analysis of Carboxyl Content in Oxidized Cellulose by Solid-sate Carbon –13 CP/MAS NMR and Near Infrared Spectroscopies," 1998 AAPS Annual Meeting, Abstract No. 2633, San Francisco, CA, November 17, 1998.

14. S. Kothari, V. Kumar, and G. S. Banker, "Compression Pressure Induced Changes in the Crystallinity of Low Crystallinity Cellulose and Commercial Cellulose

Excipients," 1997 AAPS Annual Meeting, Boston, Massachusetts, November 4, 1997.

15. G. S. Deshpande and V. Kumar, "Immobilization of Bovine Serum Albumin on 6-Carboxyl Cellulose," 1997 AAPS Annual Meeting, Boston, Massachusetts, November 4, 1997.

16. S. Kothari, G. S. Banker, and V. Kumar, "Effects of Crystallinity, Porosity, and Moisture Content of Low Crystallinity Cellulose and Commercial Cellulose Excipients on Their Tabletting (Compression and Compacting) Properties," 1996 AAPS Annual Meeting, Seattle, Washington, October 28, 1996.

17. S. E. Noormohamed, V. Kumar, T. L. Ray, and N. Vellody, "Lack of Cutaneous Toxicity of Sulfamethoxazole Hydroxylamine (a Metabolite) in Fuzzy Rats, 23rd Annual Meeting of the American College of Clinical Pharmacology, Orlando, Florida, October 6-8, 1994. Abstract published in J Clin. Pharmcol., 34, 1027 (1994).

18. S. E. Noormohamed, V. Kumar, and D. I. Min, "Efficacy of African Traditional Medicine "Compound R" on Thermal Burns in Fuzzy Rats," 1994 Winter Practice and Research Forum, American College of Clinical Pharmacy, San Diego, California, February 6-9, 1994.

19. "Maillard Reaction and Drug Stability," Invited Plenary Lecture, 5th International Symposium on the Maillard Reaction, Department of Food Science and Nutrition, University of Minnesota, Minneapolis, Minnesota, August 29, 1993.

20. "Bioadhesive Gastric Retentive Antacid Products," Invited Lecture, Berlex Laboratories Inc., Wayne, New Jersey, September 3, 1993.

21. L. Que, Jr., V. Kumar, B. P. Murch, B. A. Brennan, and Q. Chen., "Structure and Reactivity of Binuclear Iron Peroxide Complexes," 195th National American Chemical Society and 3rd Chemical Congress of North America, Toronto, Ontario, Canada, June 5-10, 1988.

22. V. Kumar, B. P. Murch, and L. Que, Jr., "Synthesis and Characterization of Oxo-Bridged Binuclear Iron Complexes and Their Reactions with Olefins," 194th National American Chemical Society Meeting, New Orleans, Louisiana, August 30- September 4, 1987.

23. L. Que, Jr., V. Kumar, and B. P. Murch, "Peroxo-Bridged Binuclear Iron Complexes and Their Reactions with Olefins," International Symposium on

Activation of Dioxygen and Homogeneous Catalytic Oxidations, The University of Tsukuba, Ibaraki, Japan, July 12-16, 1987.

24. R. F. Bryan, K. A. Woode, V. Kumar, and B. A. Averill, " Importance of a Competing Condensation Reaction in the Alloxan Synthesis of Flavins," XIII International Congress and General Assembly, International Union of Crystallography, Hamburg, Federal Republic of Germany, August 9-18, 1984.

MANUSCRIPTS IN PREPARATION

1. V. Kumar and D. Yang, Preparation and Characterization of Oxidized Cellulose Acetates.

2. V. Kumar, M. Reus, and D. Yang, Preparation and Powder Characteristics of UICEL – A New Cellulose-based Direct Compression Excipient.

3. L. Zhu, V. Kumar, and G. S. Banker, "Preparation and Characterization of Aqueous Oxidized Cellulose Dispersions and Their Use as a Carrier for Amine Drugs."

4. L. Zhu, V. Kumar, and G. S. Banker, "In-vitro and In-vivo Drug Release Characteristics of an Oxidized Cellulose-Phenylpropanol amine Entrapment Product Complex.

5. V. Kumar and R. S. Burr, and T. Yang, Pharmaceutical and Biomedical Applications of Oxidized Cellulose.